

ROYAL BOTANIC GARDENS, KEW.

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XXXIII.—A REVISION OF THE SOUTH AFRICAN SPECIES OF DIANTHUS.

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The genus *Dianthus*, as represented in South Africa, has long been a source of trouble to systematists. The characters on which we have to depend for specific delimitation are less amenable to precise definition than is the case in many other genera.

To indicate the difficulty which has been experienced by authors in dealing with them, it may be pointed out that at least ten names have been assigned by botanists at various times to specimens of what is obviously one and the same species, seven of the ten being due to wrong identification with the descriptions of other species, while on the other hand the name *Dianthus scaber*, Thunb., has been assigned at various times to specimens of twelve distinct species, owing to a misconception of the species described by Thunberg.

The only effective way to clear up this confusion was to ascertain precisely what plants Thunberg had in mind when he described his four South African *Dianthi*. By the courtesy of Professor Juel of Upsala (through the Director of the Royal Botanic Gardens, Kew) I have now had the opportunity to study these Thunberg types, and I wish to record my great indebtedness to him for this valuable assistance.

Three of the Thunberg sheets have been matched with material at Kew and the British Museum. But the Thunberg sheet of *D. incurvus* does not agree with any South African material available, nor with his description, and I can only conclude that it is not the type on which the original description was based. I consulted Professor Juel on this point during his recent visit to England; he has kindly looked into the matter since his return to Sweden and has furnished the following note, dated Botaniska Institutionen, Upsala, July 12, 1922:—"As mentioned in 'Plantae Thunbergianae' (p. 15), Thunberg published a

catalogue of his herbarium, which appeared in 61 different parts between 1791 and 1827. The main list of the herbarium was published in 1791-1797, and the part treating with the class Decandria is of the year 1793. This part enumerates only three of his *Dianthi* from the Cape (*crenatus*, *cespitosus*, *scaber*). It is only in an Appendix of the year 1806 that we find *Dianthus albens*. The name *D. incurvus* is to be found nowhere in his catalogues.

"These facts are corroborated by consulting his manuscript catalogue, which essentially corresponds to his printed catalogue of 1791-97, and in which Thunberg has added in the margin the species enumerated in his Appendix of 1806 mentioned above. Here the name "*albens*" is to be found among the species in the margin.

"From these facts it seems probable that Thunberg at the time of his Prodrômus disposed of no specimen identified by him with *D. incurvus*. The description in the Prodrômus might have been made in S. Africa. But later he seems to have found among his undetermined plants a specimen which he identified with his *D. incurvus*, although he named it *albens*, seeing that the species had been described under that name before his Prodrômus, according to Willdenow's Spec. Plant. He therefore wrote "*Dianthus albens*, Wild." and added as a synonym "*D. incurvus*, Prod. cap."

In the Flora Capensis, Sonder recognised nine species of *Dianthus*. Of these *D. incurvus*, Thunb., and *D. holopetalus*, Turcz., prove inseparable, as also do *D. prostratus*, Jacq., and *D. pectinatus*, E. Mey., thus leaving seven valid species in the Flora Capensis. To these must be added:—

D. micropetalus, Ser. (1824), placed by Sonder under *D. scaber*, Thunb.

D. Burchellii, Ser. (1824), placed by Sonder under *D. incurvus*, Thunb.

D. namaensis, Schinz (1897).

D. mooiensis, Williams (1889).

In the present paper six additional species and three varieties are described for the first time, bringing the total number of South African *Dianthi* up to seventeen species and three varieties.

The rich material now available at Kew, shows that the simple or branched habit of the flowering-stem, used by Sonder to group the South African forms, cannot be relied upon, even as a specific character, many individuals bearing both simple and branched flowering stems.

Much of the difficulty experienced by authors in placing some of the material with certainty, has been due to poor preparation by collectors. In this genus the cutting of the petal margins is of some diagnostic value, yet many specimens have been dried in such a way that this character cannot be distinguished. The relative size of the basal and intermediate cauline leaves, the relative

length of the internodes on the barren shoots, and the character of the perennial vegetative stem, are also of importance for correct classification. It is hoped that future collectors of *Dianthus* will try to make their specimens more complete in regard to these characters.

GEOGRAPHICAL DISTRIBUTION.

Dianthus is a typically Northern Hemisphere genus, not being known (except as introduced) in South America, Australia or New Zealand. Therefore the occurrence of seventeen species in South Africa, is of peculiar interest. All of these are strictly endemic, as far as known, though some of the Transvaal species may be expected to occur in Southern Rhodesia. Four species (*D. Pearsonii*, *D. kamisbergensis*, *D. namaensis* and *D. junceus*), are restricted to Namaqualand and the South-west Protectorate. One (*D. micropetalus*), extends from the South-west Protectorate, across the Kalahari and Karoo to the Eastern Cape. Another species (*D. Burchellii*), is endemic to Griqualand West, on the eastern edge of the Kalahari. Four species and one variety (*D. incurvus*, *D. Bolusii* and its var. *luteus*, *D. caespitosus* and *D. prostratus*), occur in the winter rainfall belt of the South West Cape region, (some of them extending eastward toward the Sundays River). One (*D. scaber*), appears to be peculiar to the Eastern Cape. Three species and one variety (*D. basuticus*, *D. crenatus*, *D. mooiensis* and *D. micropetalus* var. *Galpini*), extend from the Eastern Cape through Basutoland, Natal and the Orange Free State to the Transvaal. The remaining three species and one variety (*D. transvaalensis*, *D. Kirkii*, *D. Zeyheri*, and *D. mooiensis* var. *dentatus*), are known only from the Transvaal.

As in the case of *Salix**, the genus appears to have reached South Africa by way of the high mountain ranges of Eastern Tropical Africa.

Tropical African Species.—Only three species (*D. longiglumis*, Del., *D. leptoloma*, Steud., and *D. angolensis*, Hiern), are known to occur in Tropical Africa, and these three show close affinity with the South African species. They are found in Angola and Abyssinia respectively; the Abyssinian forms, or connecting links between them and the South African forms, should be sought in the high mountains of Eastern Tropical Africa.

D. leptoloma, Steud., of the mountains of Abyssinia, is a close ally of *D. basuticus*, differing chiefly in the less exserted calyx-tube.

D. longiglumis, Del., of Abyssinia, shows affinity with *D. Bolusii* and *D. basuticus* in stem and foliage, and to *D. caespitosus* in length of calyx-tube and size of petals, which, however, greatly exceed even those of *D. caespitosus*, and have very long-exserted

* Burtt Davy, J.—The Distribution and Origin of *Salix* in South Africa: *Journal of Ecology*, vol. x. pp. 62–86, 1922.

claws. It produces a large and handsome flower and might be found useful for crossing with other species.

D. angolensis, Hiern, of Angola, is allied to *D. kamisbergensis* and *D. albens*, by the short calyx-tube, but differs in foliage and petals; to *D. Bolusii* it is allied by the calycine bracts, the petals, the branching and the lower cauline leaves, but differs in the shorter calyx-tube.

KEY TO THE SPECIES.

- * Leaves mostly basal: stem-leaves mostly shorter than the basal leaves (0.5–2 cm. long), often scale-like.

- † Basal leaves short, 0.5–6 (rarely 10) cm. long, narrow and grass-like, usually forming rosettes at the apex of very short branches of the main (perennial) stem: flowering (annual) stems simple or sparingly branched, slender, erect:

- ‡ Calyx 1.5–3 cm. long over all

- Basal leaves very short, usually 0.5–1.5, (rarely up to 4) cm. long

- Petals exserted 2.5–4 mm., dentate or narrowly fimbriate (Kalahari-Karoo species) 1. *micropetalus*.

- Petals exserted 0.5–1 cm., narrowly fimbriate or dentate (Eastern Cape-Basutoland form).

- var. *Galpini*.

- Petals exserted 1–1.5 cm., lacerate-fimbriate (Western Karoo and Namaqualand species).

- 2. *Pearsonii*.

- Basal leaves longer, 2–5.5–10 (rarely only 1.5) cm. long: petals exserted 0.7–1 cm., dentate (not lacerate-fimbriate): plants 15–30 cm. high:

- Calyx 2.5–3 cm. long: bracts 3 pairs, acute, the mucro under 1 mm. long: leaf-margins scabrid: petals exserted 7–10 mm., rosy?: basal leaves 1–2 mm. broad, flat: (Eastern Cape species)

- 3. *scaber*.

- Calyx 1.5–2.5 cm. long: bracts 2 pairs, abruptly mucronate, the mucro about 1.5 mm. long: leaf-margins quite smooth: petals exserted 1 cm., white or creamy: basal leaves 0.5 mm. broad or narrower, filiform or channelled above

- 4. *transvaalensis*.

- ‡‡ Calyx very short (1–1.5 cm. long): bracts 2 pairs, ovate, abruptly mucronate: petals exserted 5–7 mm., toothed: flowering (annual) stems very weak, erect or ascending, simple or branched, 10–30 cm. long: basal leaves 2–4.5 cm. long, rather rigid, microscopically pubescent; cauline leaves 0.5–1 cm. long

- 5. *kamisbergensis*.

†† Basal leaves longer, 10–20 (rarely only 4) cm. long, forming tufts (but not rosettes).

§ Leaves below the crown more or less persistent (or sometimes none in 9. *D. Bolusii*; see also 14. *D. basuticus*).

Basal leaves 3·5–10 cm. long :

Calyx 2·5–3 cm. long : petals exserted 1 cm. or more, lacerately fimbriate : flowering stems mostly simple 6. *namaensis*.

Calyx 2 cm. long : petals exserted 5 mm. or less, dentate : flowering stems branched above 7. *Burchellii*.

Calyx 1·5 cm. long : petals exserted 0·75–1·25 cm., entire, emarginate or denticulate : calyx-teeth and bracts finely ciliolate : leaf-margins scabrid : basal leaves 1 mm. broad or less, channelled above : stems usually incurved above 8. *incurvus*.

Basal leaves 12–20 cm. long : calyx 2·5–2·75 cm. long : petals lacerately fimbriate : stems 1–8-flowered (South-West Cape species) 9. *Bolusii*.

§§ Leaves below the crown deciduous, or none (see also 9. *D. Bolusii*).

Basal leaves 4–20 cm. long, 2–3·5 mm. broad, prominently 7-nerved below, channelled above, scabrous on the margins, rigid, erect, forming a more or less dense basal tuft at the apex of the numerous underground branches : calyx stout, 2–2·3 cm. long : petals dentate, exserted 0·5–1·3 cm. : stems 1–4-flowered (Eastern species) 14. *basuticus*.

Basal leaves 2–4 cm. long : calyx 3·5–5 cm. long.

Bracts acute or with a minute apiculus, their margins broadly scarious up to and including the apex 10. *juncus*.

Bracts long-acuminate, subulate pointed, their margins (but not the apex) narrowly scarious : petals deeply lacerate, exserted up to 1·5 cm. and up to 2 cm. broad 11. *caespitosus*.

** Leaves mostly cauline, the basal often shorter than the intermediate cauline :

Leaves narrow (about 1 mm. broad), not rigid : barren shoots elongated, their internodes 1·5–3 cm. long

Calyx 3·5 cm. long : bracts acuminate, bristle-pointed : petals exserted about 1·5 cm., fimbriate : stems slender, terete, often axillary on elongated leafy shoots 12. *prostratus*.

Calyx 1·75–2·5 cm. long : bracts acute : petals exserted 0·75–1 cm., laciniately fimbriate, white 13. *Kirkii*.

Leaves broader, usually 3-5 (rarely 1.5 to 2) mm. broad and rigid : stems leafy

Calyx stout, 2.5 cm. long : petals exserted 1.5-2 cm., 1-1.5 cm. broad, variously dentate to sub-entire : intermediate cauline leaves about 5 cm. long, not rigid 15. *crenatus*.

Calyx 1.5-1.75 cm. long : petals exserted 5 mm., fimbriate, the claw not exserted : intermediate cauline leaves 2.5-3 rarely 6 cm. long, rigid 16. *mooiensis*.

Calyx 3.5 cm. long : petals exserted 1.5 cm., lacerate-fimbriate, the claw long-exserted : intermediate cauline leaves 2.5-5 cm. long, rigid 17. *Zeyheri*.

1. **D. micropetalus**, *Ser.* in DC. Prod. i. 359 (1824) !

RANGE : from the Karoo near Cradock, across the Kalahari to the South West Protectorate.

CAPE PROVINCE : Hay Div., Griquatown *Burchell* 1851 ! *type*, 1935 !; Barkly Div., Hebron (now Windsorton) *W. Nelson* 191 !; Colesberg Div., Colesberg *Shaw* !; (Middelburg Div. ?), "Snowy Mt." (Sneeuwberg) *Burke* !; Cradock Div., Great Fish River near Cradock *Burke* !; Fort Beaufort Div., and "British Kaffraria" without precise locality *Cooper* 451 pro parte !, 395 pro parte !

ORANGE FREE STATE : Without precise locality *Cooper* 1935 !; Bloemfontein Distr., Brandfort *Haagner in herb. Conrath* 1225 !; Kroonstad Distr., Kroonstad *Miss Chennel* 79 !

TRANSVAAL : Heidelberg Distr., Burttholm near Vereeniging *Burt Davy* 17133 !; Lichtenburg Distr., Korannafontein *Rogers* 20626 !

SOUTH WEST PROTECTORATE : Great Namaqualand, sandy plains north of Areb *Pearson* 9476 !

The very shortly exserted petals at once distinguish this from any of its allies, including *D. scaber* with which it has been confused. In the type specimen, which is depauperate, the flowering stems are simple, but other specimens show both simple and branched stems on the same plant.

A manuscript note by Mr. N. E. Brown, states that *Burchell* 1935 is "identical with *Rehmann* No. 3380; from Hüernerstklouf, Griqualand West, named by Dr. Szyszyłowicz *D. scaber* var. *graminifolia*, Fenzl. in *Herb. Schinz* at Zurich, compared Aug. 7, 1891."

var. **Galpini**, *Burt Davy*, var. nov., a forma typica petalis majoribus, calycem 0.5-1 cm. excedentibus, differt.

RANGE : more easterly than that of the typical form.

BASUTOLAND : grassy slopes above Buffels River Waterfall, 2500 m. alt. *Galpin* 6582 !, *type*; without precise locality *Cooper* 1934 !

CAPE PROVINCE: without precise locality *Dr. Pappe* in *herb. Hook.* !; Barkly East Div., Wittebergen Range, summit of Ben McDhui, 3000 m. alt. *Galpin* 6581 !; Queenstown Div., mts. near Queenstown, 1200 m. alt. *Galpin* 1671 !, Shiloh *Baur* 954 !, without precise locality *Drège* b. ! sub nom. *D. micropetalus*, Sering *; Fort Beaufort Div., and "British Kaffraria" without precise locality *Cooper* 451 pro parte !, 395 pro parte !; Uitenhage Div., Winterhoek Mts. *Zeyher* 80 !, between Coega and Sundays River *Drège* c. ! sub nom. *D. albus*, Ait. (non Sering.)

Baur no. 141 from Grasrug, Kaffraria, may belong here, but the calyx is only 1.3–1.5 cm. long; it does not match any other plant at Kew, and the specimen is too scrappy for precise determination.

2. *D. Pearsonii*, Burt Davy, sp. nov., *D. caespitoso*, Thunb., affinis sed calycibus petiolisque brevioribus, petalorum fimbriis brevioribus, bracteis breviter acuminatis nec subulato-acuminatis, differt.

Stems woody, usually with short, woody branches above: flowering stems 5–20 cm. high, very slender, simple or branched above. *Basal leaves* forming rosettes, 0.5–3 cm. long, 0.5–1 mm. broad, flat, with a prominent midrib beneath; margins scaberrulous. *Cauline leaves* 0.3–2.5 cm. long. *Bracts* 0.4–1.2 cm. long, ovate, acute; margins scarious. *Calyx* 3 cm. long over all. *Petals* exserted 1–1.5 cm., lacerate fimbriate, pink?.

RANGE: South West Protectorate, through Little Namaqualand to Sutherland Div.

SOUTH WEST PROTECTORATE: Great Karasberg *Pearson* 7856 ! *type*, river bed near Kai Kluit, in crevices in sandstone, 1650 m. alt. *Pearson* 7854 !.

CAPE PROVINCE: Little Namaqualand, hills at Karoebas, 3000 m. *Schlechter* 11392 !; Little Namaqualand? *Drège*, "a" sub nom. *D. micropetalus* var. β *subimbricatus*, E.M. !; Sutherland Div., Great Riet River *Burchell* 1375 ? (incomplete, and of doubtful identity).

3. *D. scaber*, Thunb., Prod. 81 (1794) !

RANGE: Eastern Cape Province, between the Bashee and Gauritz Rivers.

CAPE PROVINCE: Without precise locality, "e Cap. b. Spei" Thunberg, *type* !; "Cafferland" *Dr. Gill* !; Transkei, between the Gekau and Bashee Rivers? *Drège* !; Bathurst Div., between Blaauwkrantz and Kaffir's Drift *Burchell* 3683 !; Albany Div., flats near Grahamstown *R. W. Read* !; Uitenhage Div., Zwartkops Riv. *Dr. Pappe* !; Riversdale Div., Gauritz River *Dr. Pappe* !.

4. *D. transvaalensis*, Burt Davy sp. nov.; *D. micropetalum* var. *Galpinio*, Burt Davy, affinis, sed foliis longioribus glabris

* A mss. note by Mr. Brown states that this equals *Rehmann* 457 from Belvedere, Knysna Div., which I have not seen, but which Szyzylowicz referred to *D. scaber*, Thunb.

(nec scabris), bracteis aristatis, et petalis longioribus albidis, differt.

Rhizome shortly branched above ground, bearing several crowns. *Leaves* forming basal tufts, 5–10 cm. long, 0·5 mm. broad or less, filiform or channelled above, quite smooth; flowering stems 20–40 cm. high, slender, branched above; cauline leaves 1–2 cm. long. *Bracts* 2 pairs, acute, with an awn up to 2 mm. long. *Calyx* 1·5–2·5 cm. long. *Petals* exerted about 1 cm., white, dentate.

RANGE: Transvaal High-veld.

TRANSVAAL: Ermelo *Burt* Davy 17387! *type*, in *herb. Cantab.*; Carolina Rogers 11553!; Heidelberg Distr., Vereeniging, farm Burttholm *Burt* Davy 15016!

5. **D. kamisbergensis**, *Sond.* in *Fl. Cap.* i. 124 (1860)!

RANGE: from the Tulbagh Div., to Little Namaqualand.

CAPE PROVINCE: Without precise locality *Mund*!; Little Namaqualand, Kamiesberg *Ecklon & Zeyher* 244! *type*; Calvinia Div., Roggeveld at the Blaauwkrantz Pass, 900 m. alt. *Pearson* 4984!; Ceres Div., Leeuwfontein, common on burnt veld *Pearson* 3180!; Tulbagh Div., Nieuwe Kloof 500 m. *Schlechter* 9026!.

6. **D. namaensis**, *Schinz* in *Bull. Herb. Boiss.* v, App. 3, 84 (1897)!

RANGE: Great Namaqualand to Clanwilliam Div.

SOUTH WEST PROTECTORATE: Great Namaqualand, Tsiarub *Schinz* 553! *type*; kopjes about 30 km. south of Gründoorn, 1200 m. alt., in shallow soil in rock-crevices *Pearson* 4553!; between Dabaigabis and Gründoorn, 1250 m. alt., in fissures of granite rock on kopje *Pearson* 3151!; near Alewyn's Fontein (15 miles north) *Pearson* 3486!; Great Karasberg at Naruda Nord, in crevices of sandstone in river bed *Pearson* 7855!

CAPE PROVINCE: Nardouw Kloof, in sand, in crevices of rock, Olifants River bed *Pearson* 5334!

7. **D. Burchellii**, *Ser.* in *DC Prod.* i. 359 (1824)!

RANGE: British Bechuanaland.

BRITISH BECHUANALAND: Kuruman Div., source of Kuruman River *Burchell* 2456! *type* in *herb. Kew.*; near the Pass in Kamhanin Mt. *Burchell* 2178!.

8. **D. incurvus**, *Thunb.*, *Prodr.* 81 (1794)!; *D. albens*, *Ait.*, *Hort. Kew. Ed. 1. ii.* 90 (1789)!; *D. holopetalus*, *Turcz.* in *Bull. Soc. Imp. Nat. Mosc.* xxvii (1854) 369!

RANGE: S.W. Cape from Clanwilliam Div. south to Table Mt. and east to the Sundays River.

CAPE PROVINCE: Without precise locality *Roxburgh*!, *Admiral Sir F. Grey*!, *Harvey* 234!, 502!*, *Pappe*!; Malmesbury

* These may be Zeyher's numbers.

Div., Zwartland, Riebeeekskasteel and Paardeberg *Zeyher* 78 ! and Clanwilliam Div., Karreebergen *Ecklon & Zeyher* " 247 " (246 at Kew !) both types of *D. holopetalus*, Turcz. ; Cape Div., Cape Flats *Pappe* !, *Burchell* 723 !, Simons Bay and Chapman Bay *MacGillivray* Herald Voy. Nos., 663 ! 664 ! ; Table Mt. *Saunders* ! ; Muizenberg *MacOwan et Bolus* 91 ! ; Vygeskraal Farm and Lions Head *Wolley Dod* 124 !, 2317 ! ; Caledon Div., Hottentots-holland Berg *Ecklon & Zeyher* 242 ! ; Riversdale Div., Hills near Zoetmelks River *Burchell* 6776 ! ; Mossel Bay Div. (?), between Duyker River and Gauritz River *Burchell* 6382 ! ; Uitenhage Div., Sandfontein, Winterhoeks Berg *Zeyher* 80 !, between Coega and Sundays River *Drège* c !, Uitenhage *Zeyher* 1129 !

Sonder quite correctly followed Willdenow (1799) in uniting *D. incurvus*, Thunb. (1794) with *D. albens*, Ait. (1789), but in doing so he should not have restored Thunberg's name, rightly treated as a synonym by Willdenow. Thunberg himself accepted Aiton's name in preference to his own in his herbarium, where he has written "*D. albens*, Wild." in the lower right-hand corner where he usually labelled his specimens, while in the lower left-hand corner is written, also in his own handwriting, the synonym "*D. incurvus*, Prod. cap."† But as the name *Dianthus incurvus*, Thunb. has been familiar to students of South African botany for over sixty years, through the pages of the *Flora Capensis*, no good purpose would be served by restoring Aiton's name.

There is but one specimen labelled *D. incurvus*, in the Thunberg herbarium, and it does not agree with Thunberg's description of that species, for the petals are lacerate, not "*integris*"‡, and the cauline leaves are linear, up to 4.5 mm. broad, not at all "*lineari-setacea*". At the back of the sheet is written in the upper left-hand corner (the place where he usually noted the localities of his specimens) "*e Cap. b. Spei. Thunberg*"; but the specimen does not match any South African material at Kew or the British Museum; it appears to be somewhat abnormal, suggesting a cultivated plant, and may be a garden specimen of some extra-South African species. It is clear that the sheet was labelled later than the publication of Thunberg's *Prodromus*, for he cites Willdenow for the name *albens*, and the second volume of Willdenow's edition of the *Species Plantarum*, in which Aiton's name *D. albens* is used, was not published until 1799.

We must conclude therefore, that the specimen labelled *D. incurvus* in the Thunberg herbarium, is not the original type from which Thunberg drew his description.

Prof. Juel's suggestion that the description of *D. incurvus* may have been made while Thunberg was in South Africa, and therefore from living material, seems a probable explanation, especially

† See also note by Prof. Juel, on p. 210, preceding.

‡ The petals of the Cape Peninsula plant vary from entire or emarginate to crenate or dentate, but are not lacerate.

as he gives with such precision the locality where he found the plant, a detail omitted entirely in the case of many of his specimens; he says: "crescit in collibus infra Taffelberg latere orientali. Floret Majo, Junio."

There is abundance of herbarium material of *D. albens*, Ait., from Table Mt. and vicinity, and no other species of *Dianthus* is known to occur there.

The type of *D. albens* was grown at Kew from seed collected by Masson somewhere in the Cape Province; Thunberg travelled with Masson on one, at least, of his journeys, and Masson's seeds may have been collected at the same place as Thunberg's type of *D. incurvus*.

Aiton's type of *D. albens*, in the British Museum herbarium, agrees sufficiently (allowing for slight variation due to growth under English conditions) with Table Mt. specimens (e.g., *Wolley Dod* 124) to show that they represent one and the same species.

In describing *D. holopetalus* as distinct from *D. albens*, Turczaninow was clearly under a misconception as to the type of the latter species, for he cites as the true *D. albens*, Ait., a Transvaal plant (*Zeyher* 79) unknown to Aiton and which is the type of *D. Zeyheri*, Sond. Turczaninow cites as the types of his *D. holopetalus*, *Zeyher's* No. 78 and *Ecklon & Zeyher's* No. 247 (distributed by them as *D. albens*, Ait.); we may conclude therefore, that Turczaninow's specimens of these two numbers represented one and the same species. *Zeyher* 78 is *D. albens*, Ait.; but the Kew specimen of *Ecklon & Zeyher* 247 does not match *Zeyher* 78 (and belongs to *D. Bolusii*), while *Ecklon & Zeyher* 246 (labelled *D. crenatus*, Thunb.), compares well with *Zeyher* 78, and is referable to *D. albens* (not to *D. crenatus*). It would appear, therefore, that the labels of these two *Ecklon* and *Zeyher* numbers were transposed, and I have acted on this assumption in assigning the localities to the two plants.

9. *D. Bolusii*, *Burt Davy*, sp. nov., *D. basutico*, *Burt Davy*, affinis, sed pedunculis saepe multifloris, petalis lacerato-fimbriatis differt; a *D. caespitoso*, Thunb. caulibus foliosis, pedunculis multifloris et foliis latioribus differt.

Basal leaves tufted at the crown of a somewhat woody or more or less slender underground stem, 10–17 cm. long, 1.5–3 mm. broad; *cauline leaves* 1–5 mm. long. *Stems* slender, about 3 cm. high, much branched above (rarely simple), usually 4–8-flowered. *Bracts* 3–5 pairs, broad, acute, bristle-pointed, scarious-margined, chartaceous. *Calyx* 2.5 cm. long. *Petals* exserted 1 cm., lacerately fimbriate, dark purple.

RANGE: George to Piquetberg.

CAPE PROVINCE: Without precise locality *Ecklon?* in herb. *Hook.!*, *Drège* b. sub nom. *D. micropetalus* β *sub-imbricatus*, E.M.!.; *Swellendam* Div.; *Zondereinde River Burchell* 7497!; between *Buffeljagts River* and *Swellendam Burchell* 7295!; *Cannaland*, *Swellendam* or *Gauritz River Ecklon & Zeyher*

243 !; Puspas Valley Ecklon & Zeyher 246 ? (No. 247 at Kew !); George Div. ?, George Mts. Bowie !; Tulbagh Div., mountains above Tulbagh Waterfall, 350 m. alt. Bolus 5126 ! *type in herb. Kew.*; Nieuwe Kloof 500 m. alt. Schlechter 9033 !; Tulbagh Pappe !; Ceres Div., Michels Pass Rehmann 2332 !; Malmesbury and Piquetberg Divisions, Skurfdeberg, Twenty-four Rivers and Riebeeks-Kasteel Drège a !, (sub nom. *D. scaber*, Thunb.), Zeyher 76 !, 77 !

var. *luteus*. Burt Dary, var. nov., a forma typica petalis minoribus luteo-viridisque, differt.

CAPE PROVINCE: Paarl Div., Groot Drakenstein Rogers 17329 ! *type*.

Petals exerted 4 mm., greenish-yellow, fimbriate: calyx 2.5 cm. long. Plant approaching *D. Burchellii*, Ser., in length of petals, but these are more fimbriate, and the leaves are much longer.

10. *D. juncus*, Burt Dary, sp. nov., *D. caespitoso*, Thunb., affinis sed bracteis acutis vel minute apiculatis, marginibus apicibusque late scariosis, differt.

Stems tufted, much branched below from a woody crown. Flowering stems 30–35 cm. high, 1 mm. diam., very numerous, erect, simple, wiry. Leaves mostly basal, 2–3 cm. long; cauline leaves about 1 cm. long, appressed, not rigid, the uppermost scale-like, 5 mm. long. Calycine bracts about 4 pairs, 0.6–1.2 cm. long, with a very broad, scarious margin to the apex, acute or with a minute apiculus. Calyx 4 cm. long, the teeth with broad scarious margins. Petals exerted about 2 cm. beyond the calyx, dentate (or laciniate ?) “pale lilac.”

RANGE: Little Namaqualand.

CAPE PROVINCE: Little Namaqualand: Khamiesberg, summit of kopje South-west of Leliefontein Pearson 6312 ! *type*; lower South-east slope of Vogelklip, among bushes in dry stream-bed Pearson & Pillans 5904 !; roadside and cornlands, Brakdam Pearson & Pillans 5604 !.

11. *D. caespitosus*, Thunb., Prod. 81 (1794) !

Stems 12–38 cm. high, simple. Basal leaves 2–6 cm. long, setaceous to flat and up to 1 mm. broad; cauline leaves 0.5–1.5 cm. long, the uppermost scale-like and approaching or overlapping the calycine bracts. Calycine bracts 3–4 pairs, up to 1.7 cm. long, long-acuminate, setaceous pointed, not or scarcely scarious-margined. Calyx very long (4–5 cm.). Petals exceeding the calyx by 1–2 cm., deeply lacerate.

RANGE: Known only from the Caledon and Riversdale Divisions.

CAPE PROVINCE: “e. Cap. b. Spei,” without precise locality Thunberg ! *type*; Caledon Div., Genadendal, 600 m. alt. Schlechter 9803 !; Riversdale Div., Gauritz River Pappe !

Of the numerous specimens so named, only these two Kew sheets can be considered conspecific with the Thunberg type.

12. *D. prostratus*, Jacq., Hort. Schoenb. iii. 11., t. 271 (1798)!; Bot. Reg. t. 256 sub nom. *D. crenatus*; *D. pectinatus* E. Mey. ex Sond. in Fl. Cap. i: 124 (1859-60)!

RANGE: Calvinia and Caledon Divisions.

CAPE PROVINCE: Without precise locality Masson (seeds, from which the type specimen was grown); Calvinia Div., Uien Vlei, Bokkeveld Mts. Drège! type of *D. pectinatus*, E. Mey.; Caledon Div., Genadendal Pappe!

This appears to be closely allied to *D. caespitosus*, Thunb., and I have some hesitation in placing the plant from Genadendal (whence comes also *D. caespitosus*) in *D. prostratus*. Jacquin's figure shows a plant with distinct underground stolons and elongated leafy shoots sometimes bearing peduncles in the lower leaf axils, and the two specimens here cited match it well. The specimens referred to *D. caespitosus*, are distinctly caespitose, and do not suggest the possibility of developing elongated leafy shoots. Comparative field study of the habits of the two plants is desirable.

13. *D. Kirkii*, Burt Davy, sp. nov., species, caulum foliis intermediis quam foliis basalibus et foliis superioribus multo longioribus, petalis brevibus laciniato-fimbriatis, bene distincta.

Stems slender, ascending, 23-30 cm. high, simple or branched, especially above, leafy, the lowest and uppermost cauline leaves much shorter than the intermediate leaves, the latter 2-3.5 cm. long, 1-1.5 mm. broad, not rigid. Bracts 3 pairs, short, broad, acute, scarious-margined to the apex with a short mucro. Calyx 2 cm. long. Petals exerted about 7 mm., white, laciniately fimbriate.

RANGE: Transvaal and Natal High-veld.

TRANSVAAL: Pretoria District, near Pretoria, on kopjes, in dry sand among rocks, Nov. 1901 J. W. C. Kirk 5!, type, Magaliesberg Zeyher 81!, Pretoria and Wonderboompoort Rehmann 4706!, 4579!; Rustenburg Distr., Magaliesberg Nation 312?; Witwatersrand, Johannesburg Ommann 64!; Elsburg Rogers 12140? (material incomplete).

NATAL: near Newcastle Wilms 1864!

14. *D. basuticus*, Burt Davy, sp. nov., affinis *D. leptolomae*, Steud., et *D. crenato*, Thunb., ab illo tubo calycis brevior, ab hoc foliis basalibus caespitosis ad 5-15 cm. longis, 1.5-4 mm. latis, differt.

Basal leaves 5-15 cm. long, 1.5-4 mm. broad, tufted at the apices of the underground branches, arising from a thick (8-10 mm. diam.) woody crown; cauline leaves gradually diminishing from 25 to 5 mm. long. Flowering stems slender, erect, simple or branched above, 1-4-flowered, 8-43 cm. long. Bracts 2-3 pairs, chartaceous, yellowish, acutely pointed, mucronulate, margins narrowly scarious. Calyx 2.5 cm. long, rather stout. Petals exerted 0.5-1.3 cm., dentate, "deep pink."

RANGE : Eastern Cape Province (Albert Division) north to the Transvaal and Natal.

BASUTOLAND : without precise locality *Surenger* 3 !; Leribe, 1500–1800 m. *Mrs. Dieterlen* 184 !, *type* ; below Mont-aux-Sources 2750–3000 m. alt. *Maurice S. Evans* 746 !.

CAPE PROVINCE : Albert Div., without precise locality *Cooper* 613.

NATAL : Without precise locality *Gerrard* 1436 !, Tintern 1500–1800 m. alt. *Maurice S. Evans* 354 !, Newcastle *Wilms* 1865 ! 1866 ! *Insizwa Krook in Pl. Penth.* sub nom. *D. micropetalus* var. *graminifolius*, Fenzl.

GRIQUALAND EAST. : Vaal Bank near Kokstad *Haygarth in herb. Wood* 4178 !, near Kokstad *Tyson* 531 !

ORANGE FREE STATE : Harrismith Distr., Besters Vlei, 1650 m. *Bolus* 8124 !, Harrismith *Sankey* 13 !; without precise locality (probably Harrismith) *Cooper* 996 !; Ficksburg Distr., near Clocolan *C. M. Stockdale* !.

TRANSVAAL : Lydenburg Distr., Belfast *Leendertz* 2700 !, Pilgrims Rest *Greenstock* !

15. *D. crenatus*, *Thunb.*, Prod. 81 (1794).

RANGE : from Swellendam round the coast to Natal.

CAPE PROVINCE : Swellendam Div., “*crescit in collibus inter Swellendam et Hout-hoek. Floret Decembri*” *Thunberg* ! *type* ; Uitenhage Div., without precise locality *Zeyher* 499 ! *Dr. Pappe* !, sandy places in grass-veld at the Zwartkops River *Ecklon & Zeyher* 245 !; Albany Div., Witte River Station and Bushman's River *Dr. Gill* !, *Cooper* 1936 !, *Bowie* 4 ! (compares with *type*), grassy places, Brookhuisens *MacOwan* ! (agrees well with *type*), near Grahamstown *MacOwan* 701 !; Transkei, Bazeia 600–750 m. alt. *Baur* 14; East Griqualand, around Clydesdale, 600 m. alt. *Tyson* 2115 !

NATAL : Without precise locality *Gerrard* 737 !, *Gueinzins* !, *Dr. Sutherland* !; Alexandra County, *Dumisa Rudatis* 229 !; Durban *Krauss* 57 !, *Wood* 203 (typical) !, *D. W. B. Grant* !, *R. W. Plant* 75 !, *Rudatis* 1512 !; Claremont *Schlechter* 3047 !; Inanda Wood 747 !; Ixopo *Mrs. Clarke* 15 ! (a form approaching *D. basuticus* *Burt Davy*).

TRANSVAAL : Lydenburg Distr., near Lydenburg *Wilms* 57 ! *Atherstone* !; Devils Knuckles near Spitzkop *Wilms* 59 !; Barberton Distr., Bosch's near Barberton 1200 m. *Galpin* 1269 !; Middelburg Distr., between Middelburg and the Crocodile River *Wilms* 56 !, Bronkhorstspuit *Wilms* 60 !

There is no material of *D. crenatus* at Kew, from the *type* locality, and until it is re-collected there, some doubt may be felt as to the identity of the eastern and western forms, though the Albany plant seems to be a good match with the *type*. The flowers are described as “rosy.”

The Transvaal material is somewhat off type, approaching *D. basuticus*, Burt Davy, in some of its characters.

16. **D. mooiensis**, Williams in Journ. Bot. xxvii. p. 199 (1889) !; *D. Nelsoni*, Williams, in Journ. Bot. 1889, p. 200 !

RANGE : High-veld of the Transvaal.

TRANSVAAL : Potchefstroom Distr., Mooi River *Nelson* 334 ! type, Wonderfontein on the Mooi River, *Nelson* 554 ! type of *D. Nelsoni*, Williams; Witwatersrand, Orange Grove *Rogers* 22386 !; Pretoria Distr., near Pretoria *Burt Davy* 724 !, *Janse in T.M.H.* 2808 ?; Heidelberg Distr., Heidelberg *Leendertz* 1020 !; Standerton ? *Rogers* 18777 !.

GRIQUALAND EAST : Near Kokstad, 1100 m. *Tyson* 1119 !

NATAL : Between Greytown and Newcastle *Wilms* 1863 !

I can find no specific difference between the two plants named as above by Williams, though he places them in separate sections. The accepted name was originally published by the author as "moviensis" from the "Movi River," obviously a mistake for Mooi River, due to a badly written label, and therefore open to correction.

This species is the High-veld ally of *D. Zeyheri*, Sond.

var. **dentatus**, *Burt Davy*, var. nov., a forma typica petalis dentatis roseis albidisve, calycis brevioribus et foliis basalibus longioribus, differt.

TRANSVAAL : Pretoria Distr., Rayton *Rogers* 12915 !, type.

17. **D. Zeyheri**, *Sond.* in Fl. Cap. i. 124 (1860) !; *D. Colensoi*, Williams in Journ. Bot. xxiii, 344 (1885) !; *D. meciostocalyx*, Williams in Journ. Bot. xxvii, 199 (1889) !.

RANGE : Bush-veld of the Transvaal.

TRANSVAAL : Pretoria Distr., Magaliesberg *Zeyher* 79 !, *Burke* 264 !, types; Wonderboompoort *Rehmann* 4581 !; Brits *Stent* in *T.D.A.H.* 6117 !; near Pretoria *McLea* in herb. *Bolus* 5587 !; Aapjes River *W. Nelson* 555 ! (type of both *D. Colensoi* and *D. meciostocalyx*); Premier Mine *Rogers* 25216 !; Rustenburg Distr., Kloof of Magaliesberg *Nation* 282 !, *Collins* 132 !; Middelburg Distr., Wilge River *Schlechter* 3743 !; Waterberg Distr., between Klippan and Elands River *Rehmann* 5015 !; Pietersburg Distr., Pietersburg *Bolus* 11042 !; Lydenburg Distr., Elandspruitbergen *Schlechter* 3856 !, Lydenburg *Wilms* in *T.M.H.* 6464 !, Pilgrims Rest *Greenstock* !.

Nelson notes : "Rare"; "flowers purest white, 2½ in. diameter, much fimbriated." Williams cites Nelson's plant as the type of his *D. Colensoi*, but erroneously gives "coast of Natal" as the type locality. He correctly described the flowers as white, but included the plant in the Section *Barbulatum*, which he defined as having flowers "rosei purpureive".

A specimen collected by *Rogers* (No. 22325 !) in the Kloof at Rustenburg, Transvaal, has been referred to the S.W. Cape

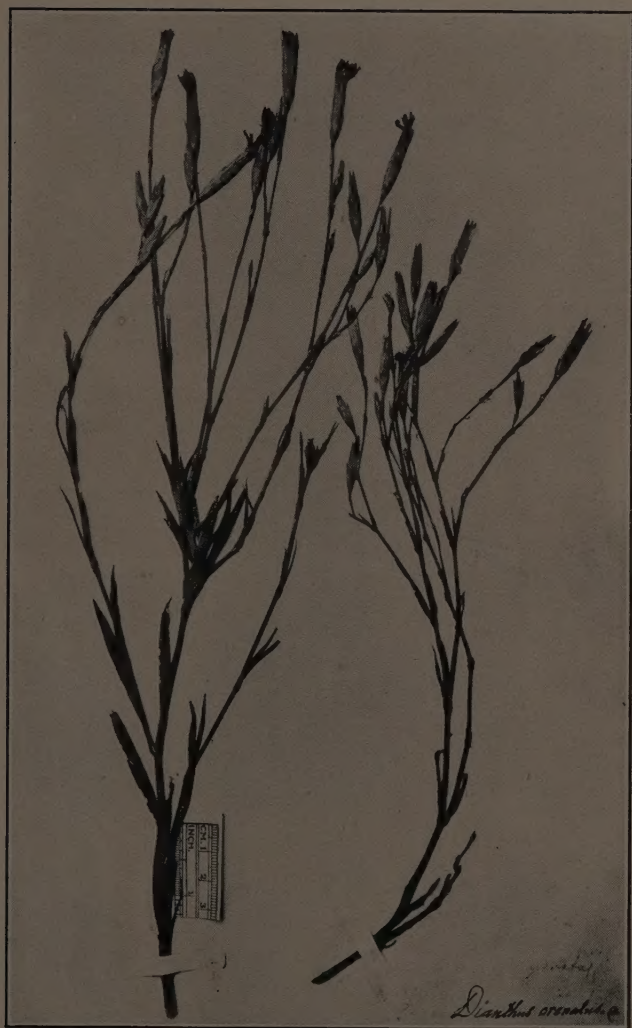


PLATE II.

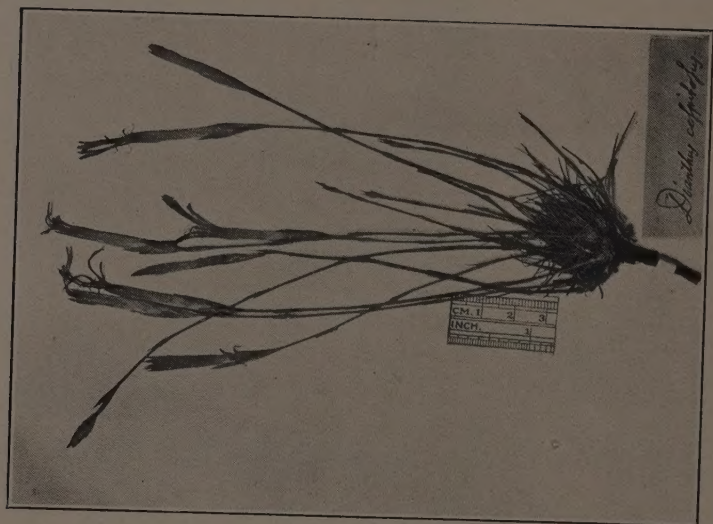


FIG. 2.

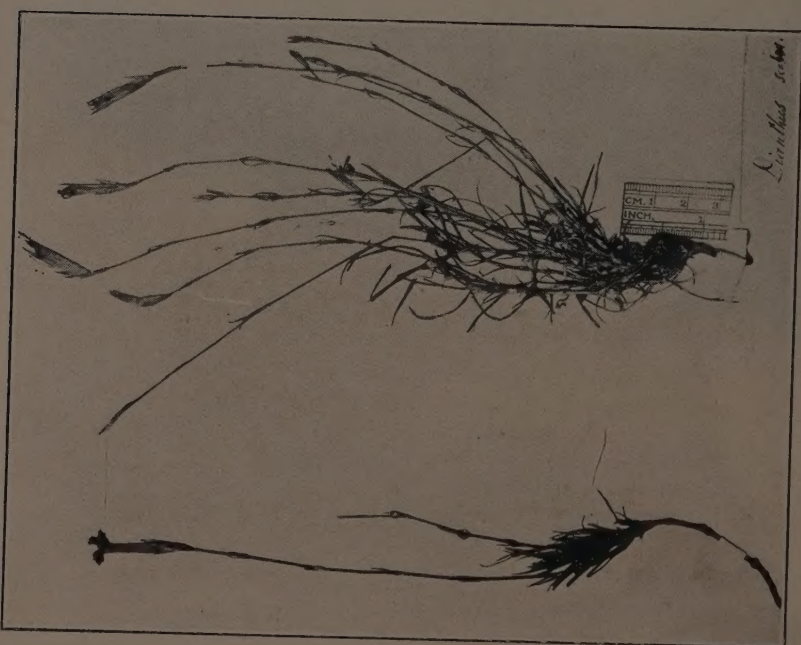


FIG. 1.

D. prostratus, Jacq. (*D. pectinatus*, E. Mey.), but differs from that species in the terminal inflorescence, broader leaves and shorter, acute, not acuminate, involucre bracts; it appears to be a shade-grown form of *D. Zeyheri*, Sond.

EXPLANATION OF PLATES.

The figures are reproduced from photographs by Miss E. Brown, of three of the five sheets in the Thunberg Herbarium.

Pl. I., Fig. 1. *D. scaber*, Thunb.; type. Between the two specimens of *D. scaber*, there has been mounted (evidently at a later date) a specimen of another species, numbered 2, from "Helvetia" as indicated on the back of the sheet. To prevent confusion this has been cut out from the print.

Fig. 2. *D. caespitosus*, Thunb.; type.

Pl. II.—*D. crenatus*, Thunb., β ; type.

XXXIV.—MISCELLANEOUS NOTES.

MR. R. E. HOLTUM, B.A., Junior Demonstrator in Botany in the University of Cambridge, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Assistant Director of Gardens, Straits Settlements.

MR. H. K. HEWISON has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Assistant Superintendent, Agricultural Department, Gold Coast, and CAPTAIN J. W. D. FISHER, Assistant in the Agricultural Department, Sierra Leone.

The Royal Botanic Gardens, Trinidad.—When any good work has been kept going for a century without a break, it is invariably a matter for congratulation. It shows that the continuity of action of those in authority—who whether from motives of economy or indifference are in a position by a stroke of the pen, as it were, to destroy the results of years of labour and foresight—has been of the right sort. The establishment here recorded as occupying this congratulatory position has a world-wide fame, and the establishment of a College of Tropical Agriculture to which the Gardens will no doubt prove a valuable asset, is a mark befitting its centenary. Founded in 1818 the Garden completed a century in 1919. It is not the oldest in its original foundation—this distinction belongs to St. Vincent (1766) which, it is reported, was drawn upon when more than 50 years old, to supply the Trinidad Garden with its first plants; but Trinidad comes first in the West Indies for an unbroken period of existence.

The following particulars are quoted from a paper by the present Director (Mr. W. G. Freeman) in "The Trinidad Christmas Guardian" 1919.

"The Gardens were established in the year 1818, in the time of Sir Ralph Woodward, under the direction of Mr. Lockhart. Many of the plants were imported from Caracas and St. Vincent. Mr. Lockhart was Assistant Botanist attached to the ill-fated expedition of Captain Tuckey up the River Congo in 1816 during which he suffered severely and was long a patient in the hospital at Bahia. He visited Venezuela and the countries of the Orinoco, discovering the "Cow Tree" (*Brosimum utile*) and the "Saman" or "Zaman" (*Pithecolobium Saman*) which with many kinds of orchids he introduced to Trinidad and during his incumbency special attention was given to the introduction and cultivation of the various spice trees. Under the fostering care of Lord Harris, for many years Governor, the Gardens flourished and their area was considerably extended. It is said that he annually expended from his private purse a large sum towards their development. Mr. Lockhart was succeeded by Mr. Purdie on the recommendation of Sir William Hooker in 1846 and afterwards the Gardens were successively under the care of Dr. Crueger 1857, Henry Prestoe 1864; J. H. Hart 1887 and J. B. Carruthers 1909-1910 during which many notable trees were introduced including the "Saman" (as before stated by Lockhart)—the oldest tree to the west of Government House having now a spread of branches of 180 feet and a height of 147 feet; "Nutmegs" (*Myristica fragrans*) from the St. Vincent Garden in 1824; the "Mango" (*Mangifera indica*—good varieties) from India and Martinique in 1859 and many others from all parts of the world. The distribution of plants was also effected on a large scale and the article concludes with: "I think we may safely say that much has been done and that during the past century the Royal Botanic Garden has been the means of introducing and distributing many of the plants on which the welfare of the Colony is based, and others which are of value for the sake of their fruits and flowers."—J. H. H.